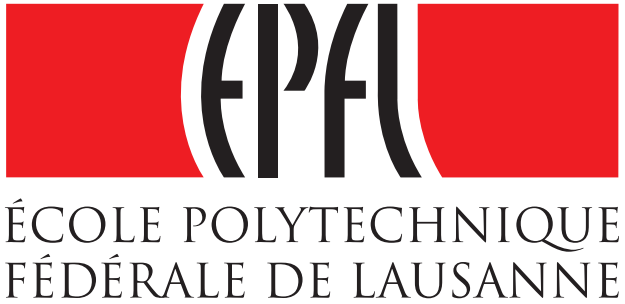


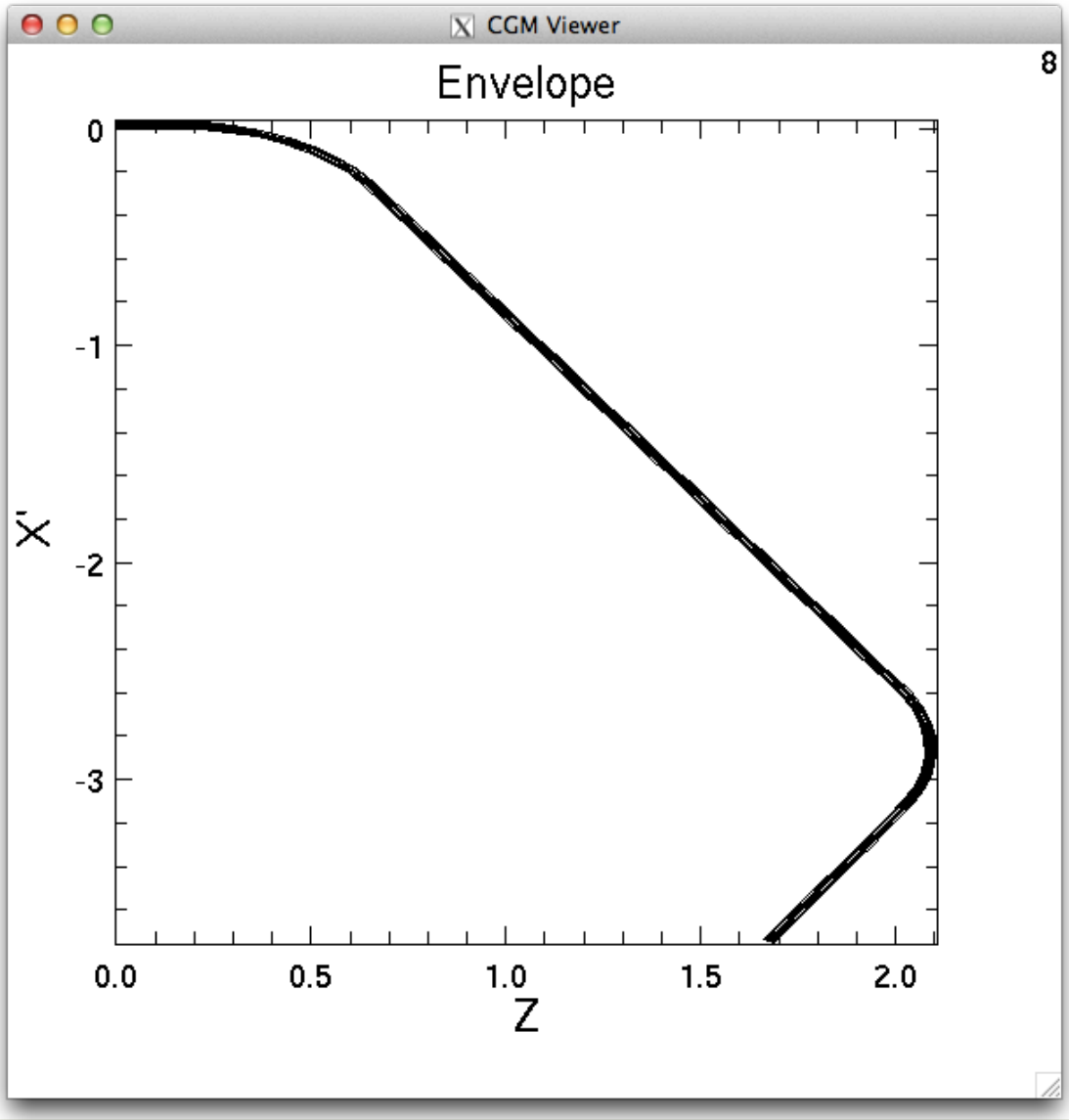
ÉCOLE POLYTECHNIQUE
FÉDÉRALE DE LAUSANNE

WARP Simulations Update

Topics:

- What has been done?
  - Particle Extraction
  - Fast particle mover
  - Linear setup
- Problems
  - Over bending in turn
- To be done
  - Bend correction
  - Windows
  - Decision of which data to extract
  - Restart procedure guide

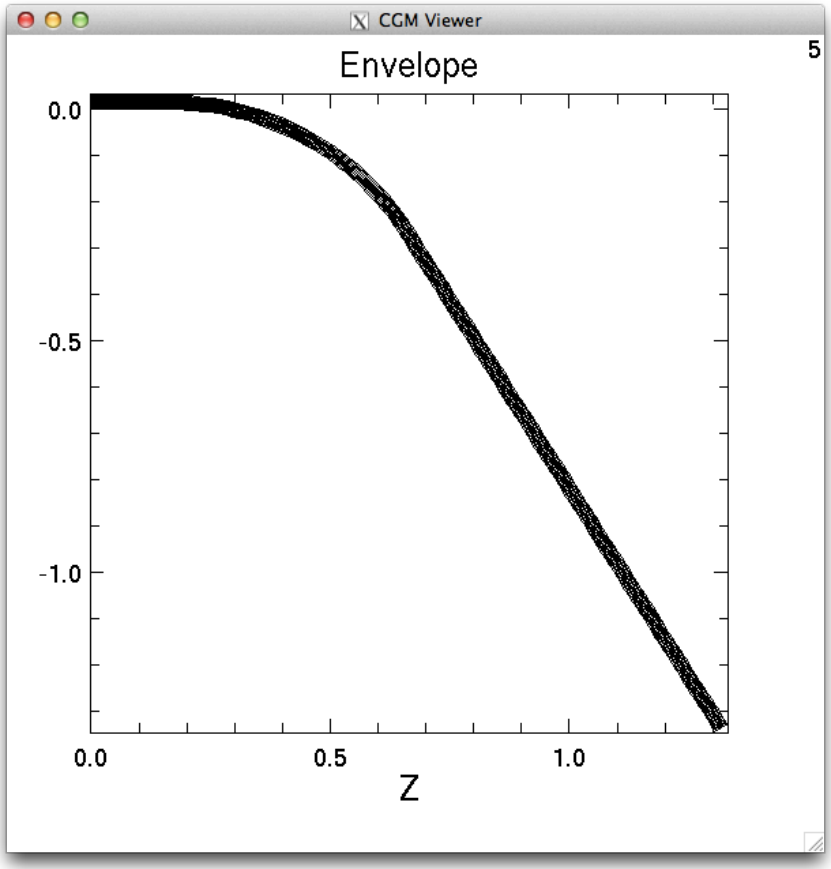
TEL2 setup

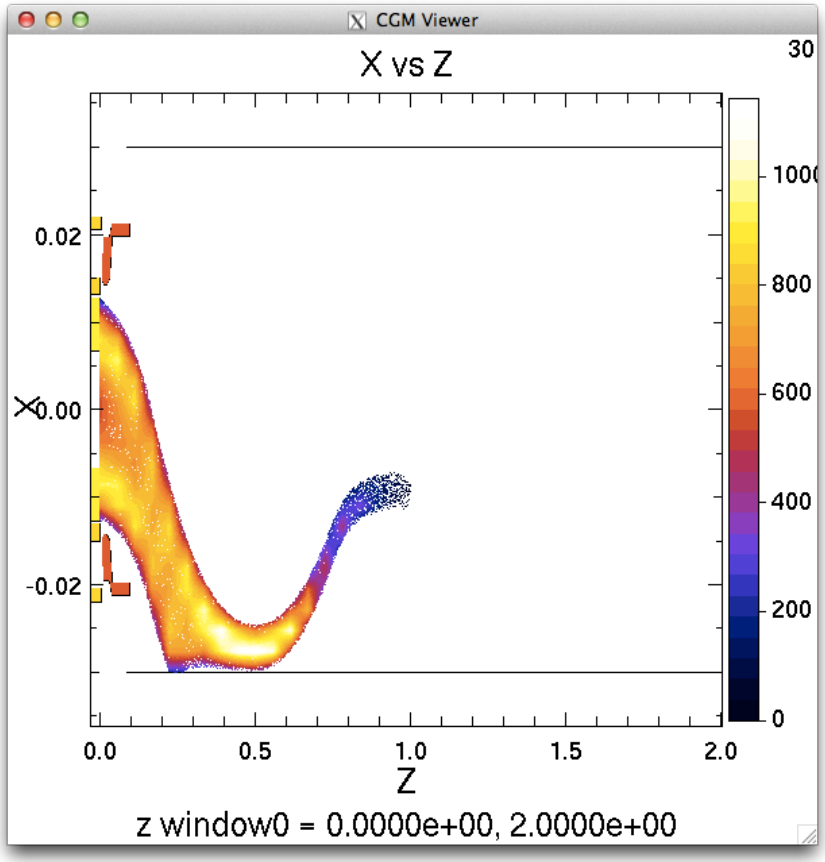


- 58 degrees bends
- 3 solenoids in bends
- New syslength 4.68m

Bend only changes lattice if top.diposet correct

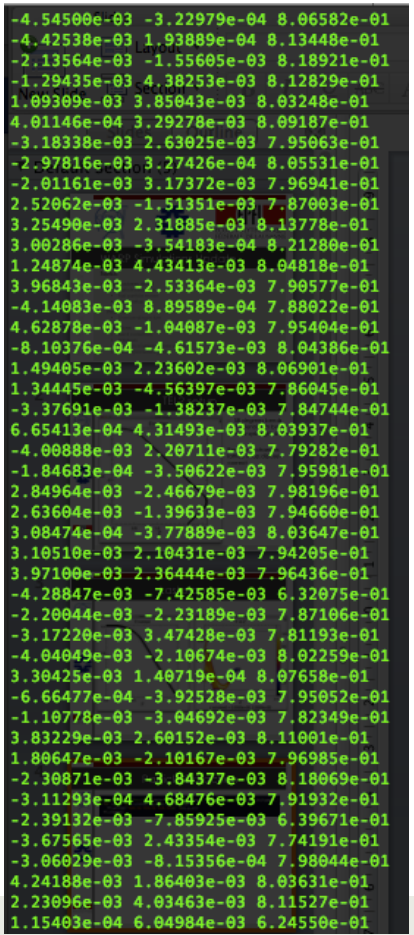
Last stance


CGM Viewer
Envelope
5
0.0
-0.5
-1.0
0.0
0.5
1.0
Z


CGM Viewer
X vs Z
30
0.02
0.00
-0.02
X
0.0
0.5
1.0
1.5
2.0
Z
1000
800
600
400
200
0
z window0 = 0.0000e+00, 2.0000e+00

Particle Extraction

```
ff = open('../Results/'+date+'/'+machine_type+"_"+date+time+"_"+machine_injtype+"_"
for x,y,z in zip(elec.xp,elec.yp,elec.zp):
  ff.write('%10.5e %10.5e %10.5e\n' %(x,y,z))
ff.close()
```

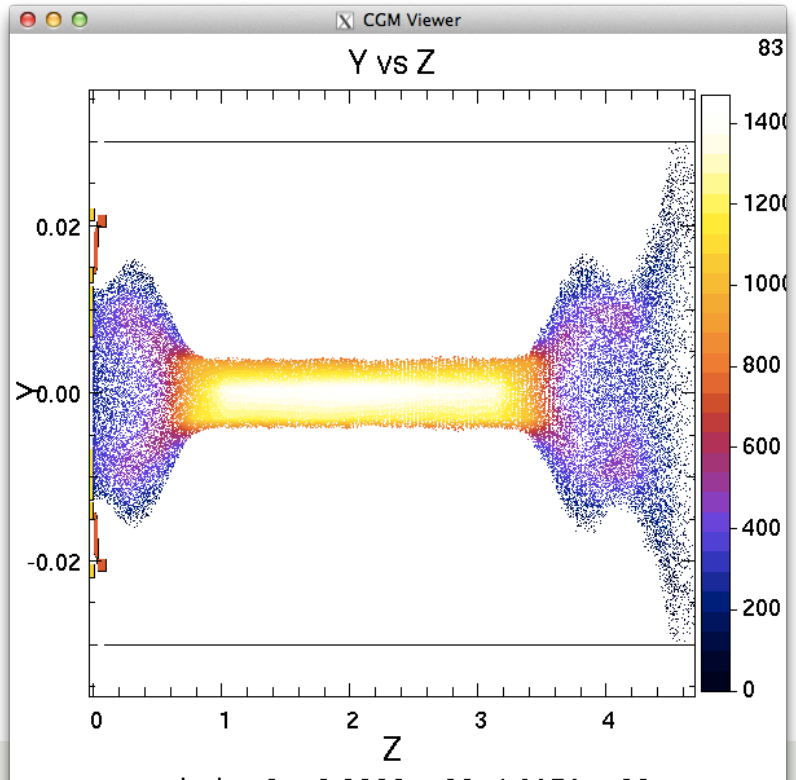


- Cleanup necessary – Text information
- File size = 120 kb
- List of all extractable information necessary
- Plottable in other tools (3D Plots?)

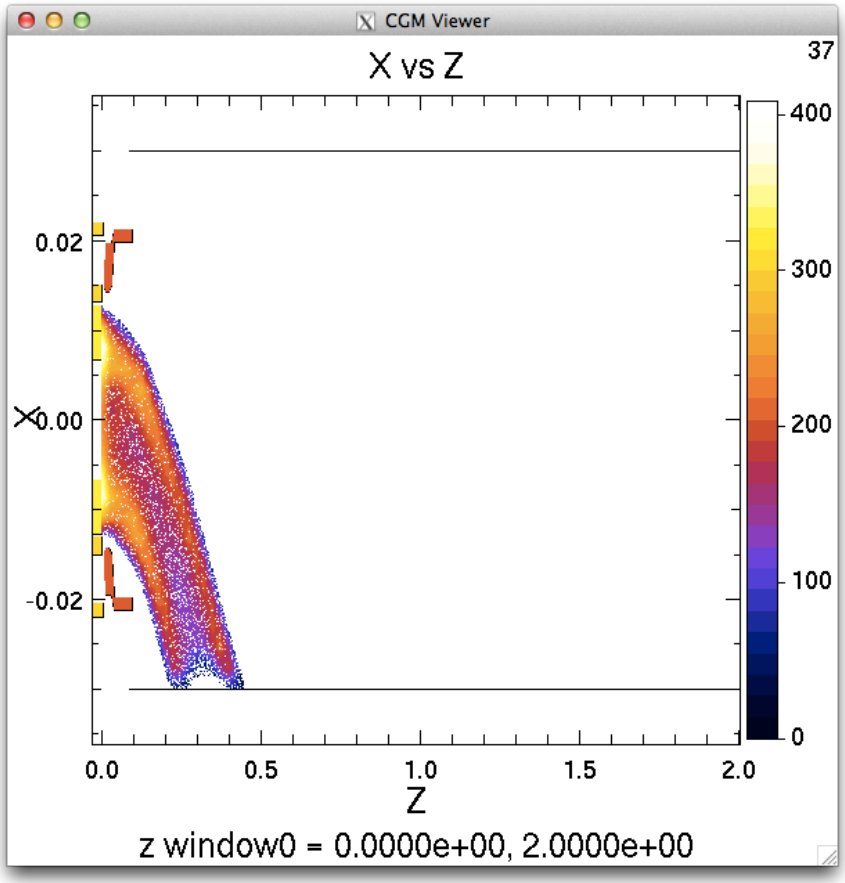
Fast Particle Mover

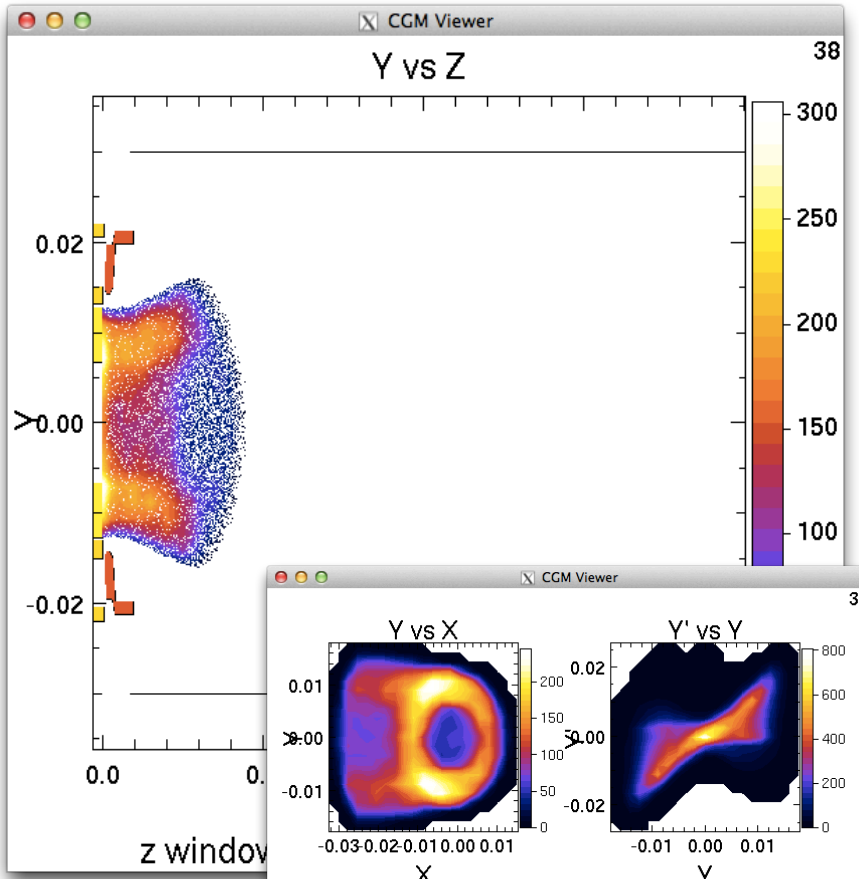
```
w3d.interpdk[1]=1
w3d.igradb=1
from loadgradb import setbsqgrad
setbsqgrad(w3d.nx,w3d.ny,w3d.nz,w3d.xmmin,w3d.xmmax,w3d.ymmin,w3d.ymmax,w3d.zmmin,w3d.zmmax)
```

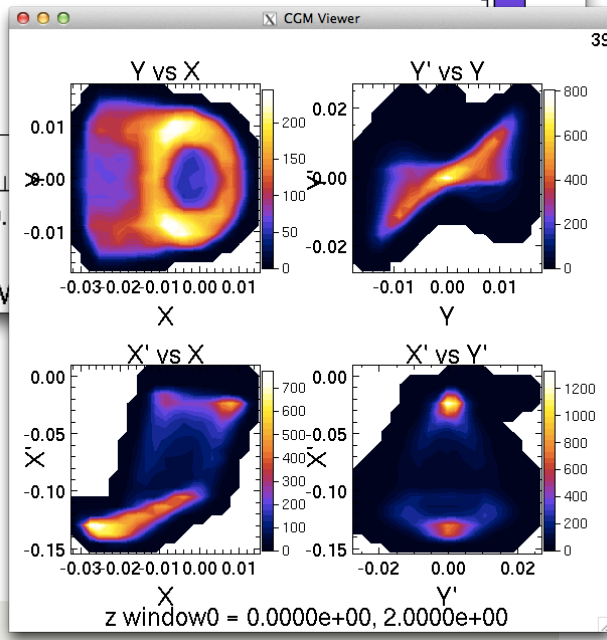
- At least 50 times less timesteps -
- Can simulate 1.5 m on my local desktop at LHC magnet settings
- Install WARP on vdisk 1 -> 100%?



Bend issues – TEL2 settings

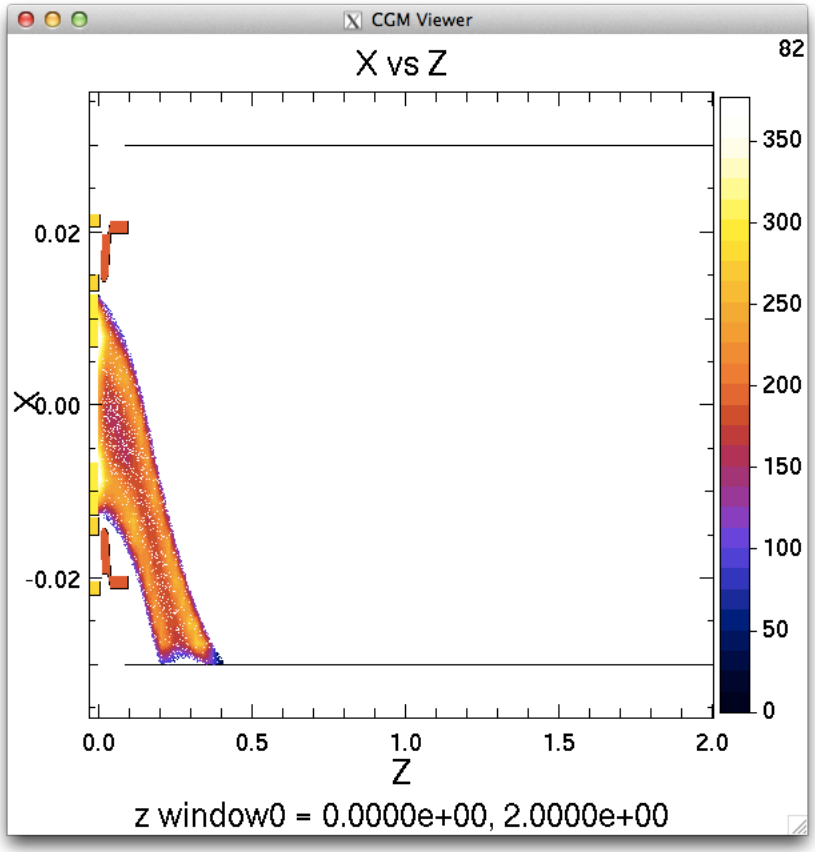


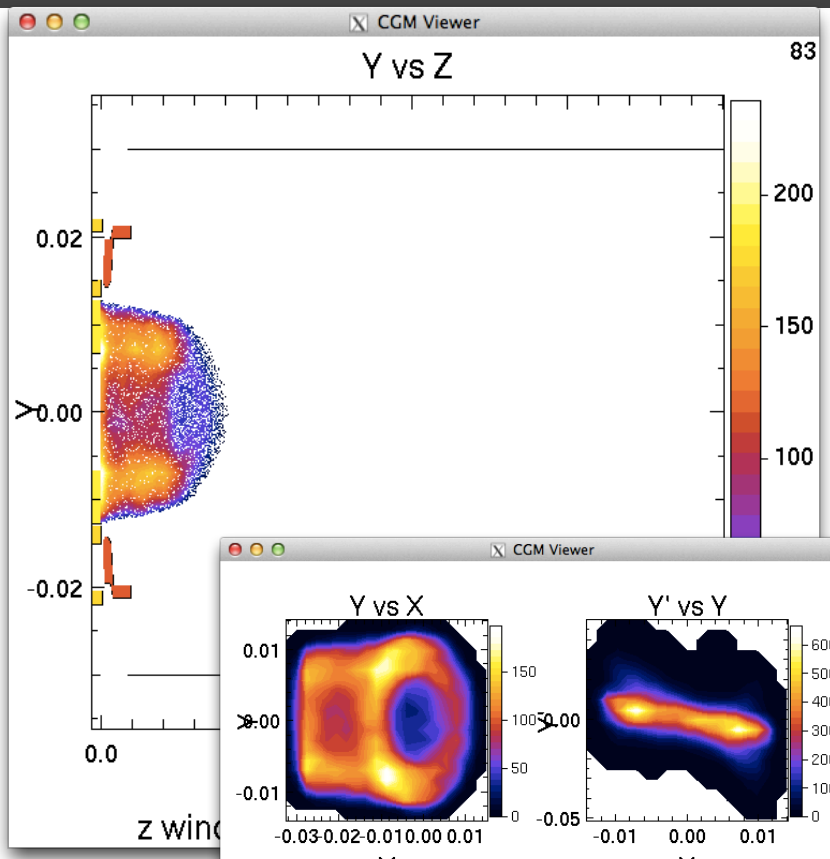


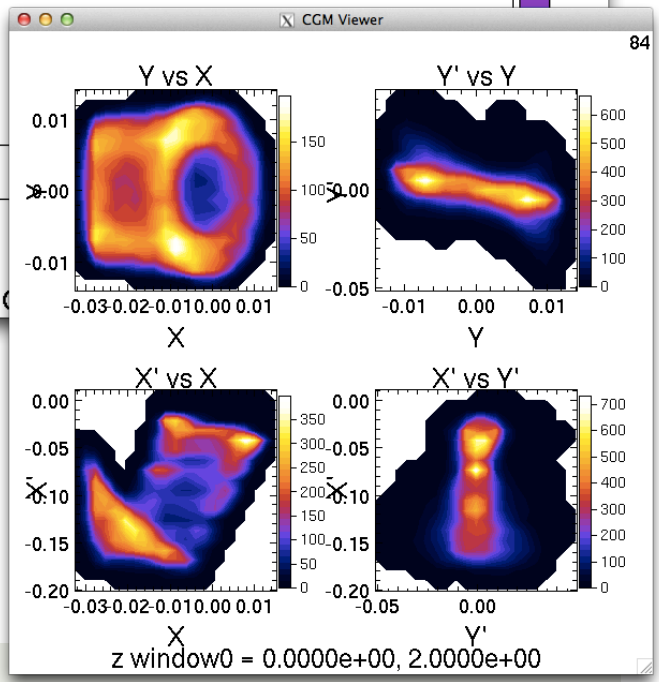


Settings:
Bmain=5, Bcoll=0.43, Bbend=Bcoll/9.35
Cathode Voltage: 500V

Bend issues – TEL2 settings



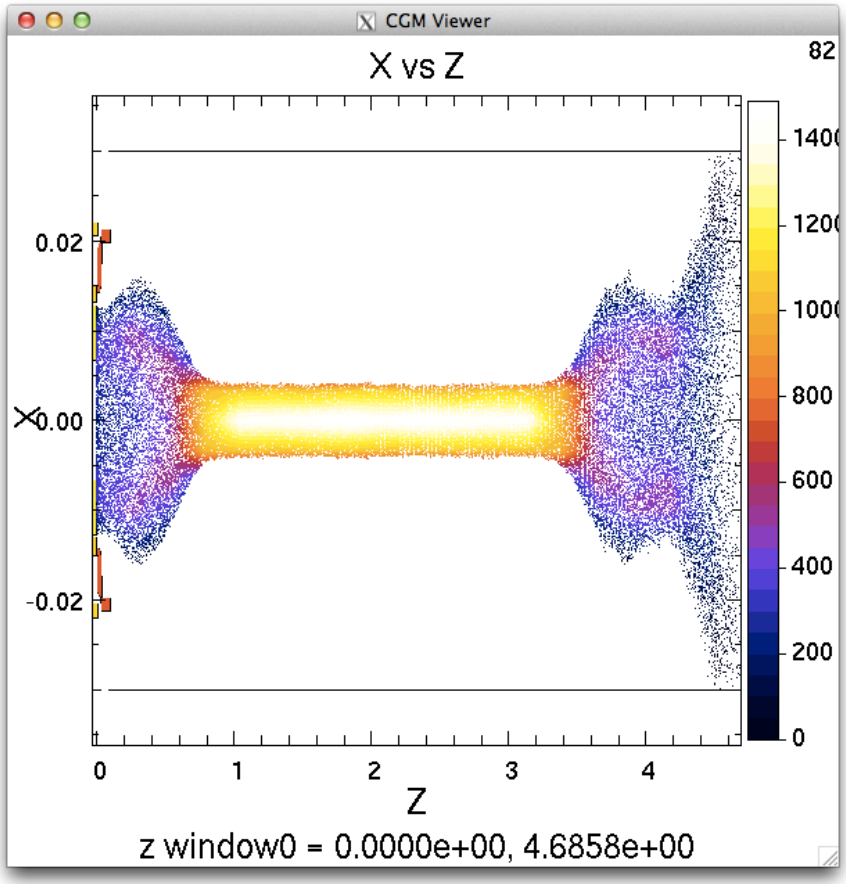


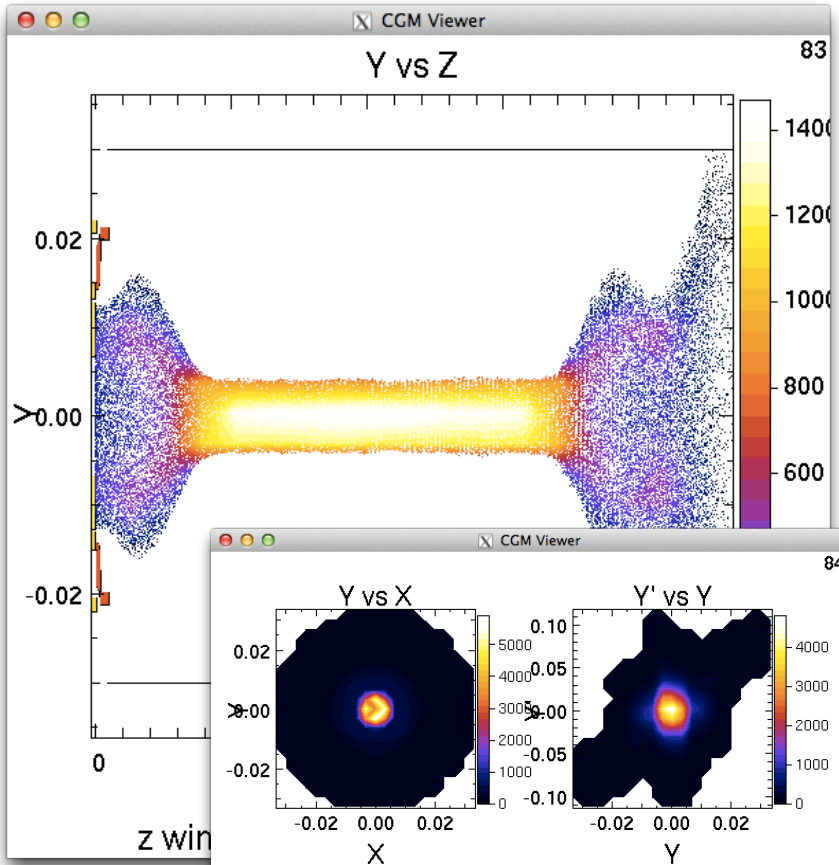


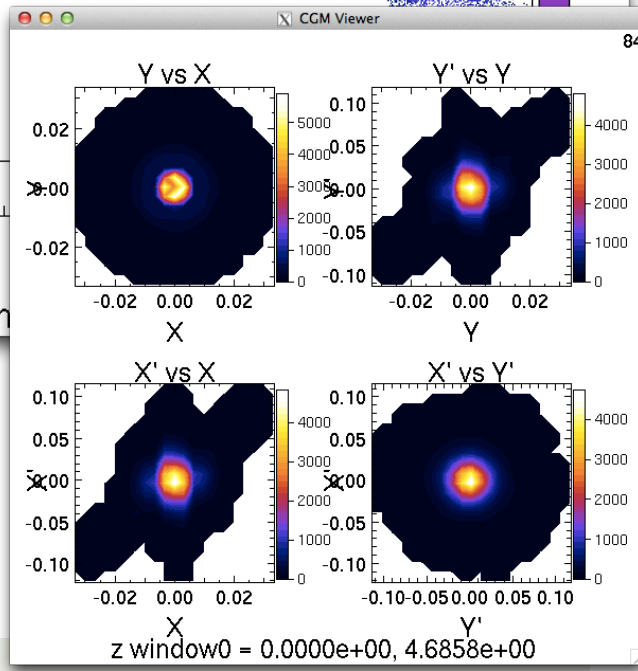
Settings:
Bmain=5, Bcoll=0.43, Bbend=Bcoll
Cathode Voltage: 500V

What to do about bends?

Linear TEL2 setup







Settings:
Bmain=5, Bcoll=0.43, Bbend=Bcoll
Cathode Voltage: 500V

Is the whole good enough?

Next steps

- Install WARP on vdisk1 and check if powerfull enough
- Figure out bend issues -> Plot magnetic field along simulation
- Implement window and plot limits for center of interaction region to study hole
- Write dump & restart instructions
- Plot particle export data
- Run a set of sample simulations for LHC, TEL2 and tbench parameters. –> focus on gun injection

- ADMIN rights on vdisk1?